

REMARKS

This is in response to the Office Action mailed September 6, 2006.

As per the Examiner's suggestions on page 2 of the Office Action of September 6, 2006, minor amendments have been made to claims 3, 4, 16, 17, and 22 without adding new matter. Specifically, with respect to claim 3, the phrase "across networks" has been corrected to recite "across network elements". With respect to claim 4, the phrase "across network element" has been corrected to recite "across network elements". With respect to claim 16, the phrase "has exceed" has been corrected to recite "has exceeded". With respect to claims 17 and 22, the phrase "control information" has been corrected to recite "wherein control information". Applicants wish to reemphasize that the above-amendments have been made without adding new matter and for clarification purposes only.

This response should obviate outstanding issues and make the pending claims allowable. Reconsideration of this application is respectfully requested in view of this response/amendment.

STATUS OF CLAIMS

Claims 1-22 are pending.

Claims 3, 4, 16-17, and 22 are objected to for minor informalities.

Claims 13, 17-18, and 22 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

Claims 1, 3, 4, and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 6,965,899 (Subramanian et al.) in view of U.S. 6,460,048 (Teng et al.).

Claims 2, 5-8, and 10-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 6,965,899 (Subramanian et al.) in view of U.S. 6,460,048 (Teng et al.) and further in view of U.S. Pub. 2001/0047360 (Huras et al.).

Claims 13-14, and 18-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pub. 2002/0143743 (Iyer et al.) in view of “*Database Reorganization – Principles and Practice*” (Socket et al.).

Claims 15-17, and 20-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pub. 2002/0143743 (Iyer et al.) in view of “*Database Reorganization – Principles and Practice*” (Socket et al.) and further in view of U.S. 6,460,048 (Teng et al.).

OVERVIEW OF CLAIMED INVENTION

The method of the present invention provides for the reorganization of a table space to improve access performance and reclaim fragmented space. A database reorganization utility (hereafter, DB2 REORG) is utilized to write rows that are added to a designated object, to a larger page. In this manner, the designated object would remain available, would not require recreation, nor would existing DB2 authorizations be deleted. By reorganizing table space such that constituent rows are read from existing pages and then copied to larger pages, which will subsequently be externalized, the requirement to take the designated object offline while changing the page size is obviated. Subsequent to table reorganization, DB2 control blocks along with the DB2 catalog are updated to reflect the change in page size.

In one embodiment, the present invention's method comprises the steps of: (a) allocating a shadow data set for at least one object belonging to a first data set from the table space; (b) writing to a shadow control block corresponding to each of the allocated shadow data sets, a page size value larger than a page size value to be allocated; the larger page size value corresponding to said at least one object; (c) loading rows from the first data set of the table space into the allocated shadow data set; for each row loaded, reading each object corresponding to the loaded row from the table space and writing said read object to the allocated shadow data set; and (d) updating at least: the first data set of the table space with data from the shadow data set; a system catalog for the database with the larger page size value; and at least one database control block with the larger page size value; with the at least one database control block corresponding to said first data set. The present invention also teaches an article of manufacture having computer readable program code implementing the above-mentioned method.

In another embodiment, the present invention teaches the reorganization of a designated object of a database that has exceeded a current page size by: (a) writing to a larger page, rows added to said designated object; (b) permitting continual access to said designated object during said writing step; (c) reading constituent rows from a plurality of existing pages corresponding to said designated object and subsequently copying said constituent rows to said larger page; and (d) externalizing said designated object. The present invention also teaches an article of manufacture having computer readable program code implementing the above-mentioned method.

REJECTIONS UNDER 35 U.S.C. § 112

Claims 13, 17-18, and 22 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Claims 13 and 18 have been amended to remove inconsistencies with the specification. No new matter has been added via the current amendment. A minor amendment has also been made to claims 17 and 22 to correct antecedent basis issues. Specifically, the phrase “said change in page size” has been amended to recite “a change in page size”. Claims 1 and 9 have been amended for clarification purposes to recite “a larger page size” instead of “a new page size” without adding new matter. Support for this amendment can be found throughout the specification, beginning with the title which specifically mentions a “method of changing the page size”. Other examples of support includes can be found in the “Summary of the Invention” section of the application-as-filed which recites multiple instances of “a larger page”. Applicants respectfully request the Examiner to withdraw the 35 U.S.C. §112 rejection with respect to claims 13, 17-18, and 22.

REJECTIONS UNDER 35 U.S.C. § 103(a)

Claims 1, 3, 4, and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 6,965,899 (Subramanian et al.) in view of U.S. 6,460,048 (Teng et al.). Claims 2, 5-8, and 10-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 6,965,899 (Subramanian et al.) in view of U.S. 6,460,048 (Teng et al.) and further in view of U.S. Pub. 2001/0047360 (Huras et al.). Claims 13-14, and 18-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pub. 2002/0143743 (Iyer et al.) in view of “*Database*

Reorganization – Principles and Practice” (Socket et al.). Claims 15-17, and 20-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pub. 2002/0143743 (Iyer et al.) in view of “*Database Reorganization – Principles and Practice*” (Socket et al.) and further in view of U.S. 6,460,048 (Teng et al.).

To be properly rejected under 35 U.S.C. §103(a), every feature of the claims must be addressed through known prior art or be recognized as an obvious variation thereof. Applicants contend that the above-mentioned specific combinations of references fail to provide many of the features of the Applicants’ claims.

With respect to independent claims 1 and 9, the Examiner contends that the Subramaniam and Teng references, in combination, teach all the features of Applicants’ claims 1 and 9. Applicants respectfully disagree with this assertion.

Subramaniam et al. teaches a method for modifying a target table within a relational database. Subramaniam’s method comprises the steps of: creating a revised table that has one or more attributes that are different than corresponding attributes of the target table. While the revised table is being created, users are prevented from accessing the revised table, but are allowed to access the target table. According to Subramaniam’s method, when creation of the revised table is complete, the target table is locked and the revised table is synchronized with the target table, causing all subsequent attempts to access the target table to access the revised table.

Teng et al. teaches a method for reorganizing a database object, wherein the database object is comprised of at least one database file. Teng et al.’s method comprises the steps of: providing source database files including data for the database objects subject to a reorganization, wherein the source database files have source names; creating shadow copies of the source database files; generating shadow names for the shadow copies, wherein the source

names and corresponding shadow names are different; and reorganizing data in the shadow copies including database objects, wherein after the reorganization, the shadow names are used to access the database files for the reorganized database objects.

Independent claims 1 and 9 of the present invention, in stark contrast, teach a method for updating object page size during reorganization of a table space. With respect to claims 1 and 9's feature of "writing to a shadow control block corresponding to each of said allocated shadow data sets, a page size value larger than a page size value to be allocated" For support for this feature, the Examiner cites column 2, line 59 through column 3, line 12 of Subramaniam. Applicants respectfully disagree with the Examiner as the citation merely teaches an "online modification technique" that allows the database administrator to perform various types of modifications to the target table.

The citation of Subramaniam goes on to include specific types of modifications such as: 1) modifying the storage parameters of the target table, 2) adding support for parallel queries to be performed on the target table after the target table is modified, 3) changing a heap organized target table to an Index Only Table (IOT) or vice versa, 4) moving the target table to a different tablespace, 5) adding or dropping partitioning support for the target table, 6) recreating the target table in order to reduce fragmentation, 7) adding, dropping, or renaming columns in the target table, and 8) transforming data in the target table.

Conspicuously absent in the above "types of modifications" of Subramaniam is an explicit or implicit teaching or suggestion for writing to a shadow control block corresponding to each of said allocated shadow data sets, a page size value larger than a page size value to be allocated. In fact, Applicants respectfully assert that neither the citation nor the entire Subramaniam reference teaches any modification to the page size value. Such a feature is also

not remedied by the Teng reference. Absent such a teaching, the Subramaniam reference, either by itself or in combination with Teng, cannot render obvious the teachings of claims 1 and 9.

Applicants agree with the Examiner's conclusion that Subramaniam reference does NOT teach claim 1 and 9's feature of "updating at least: said first data set of said table space with data from said shadow data set; a system catalog for said database with said larger page size value; and at least one database control block with said larger page size value; said at least one database control block corresponding to said first data set". However, Applicants respectfully disagree with the Examiner that such a feature is remedied by the Teng reference. Specifically, for support, the Examiner cites column 6, lines 55-65 of Teng as teaching this feature of claims 1 and 9.

Column 6, lines 55-65 of Teng merely reference Figure 2 which teaches the reorganization of "shadow copies of data sets". However, Applicants respectfully assert that neither Teng's Figure 2 nor Teng's description of Figure 2 attempts to teach or suggest updating "a system catalog for said database with said larger page size value". Applicants also assert that Teng's reorganization procedure shown in Figure 2 and accompanying description fail to teach or suggest updating "at least one database control block with said larger page size value". Absent such a teaching, the Subramaniam reference, either by itself or in combination with Teng, cannot render obvious the teachings of claims 1 and 9.

Applicants wish to note that the above-mentioned arguments for independent claims 1 and 9 substantially apply to dependent claims 2-8 and 10-12 as they inherit all the features of the claim from they depend. Applicants, therefore, respectfully request the Examiner to withdraw the rejection with respect to claims 1-12 and, hereby, respectfully request the Examiner to allow claims 1-12.

Independent claims 13 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pub. 2002/0143743 (Iyer et al.) in view of “*Database Reorganization – Principles and Practice*” (Socket et al.). Independent claims 13 and 18 teach a method of reorganization wherein the claims teach at least the features of “writing to a larger page, rows added to said designated object” and “reading constituent rows from a plurality of existing pages corresponding to said designated object and subsequently copying said constituent rows to said larger page”.

Applicants agree with the Examiner’s conclusion that the feature of a larger page is not taught or suggested by the Iyer reference. However, Applicants respectfully disagree with the Examiner that such a feature is taught by page 386, column 2, second paragraph 2 of the Sockut reference.

Sockut merely provides a general overview of database reorganization methods. On page 386, Sockut merely describes utilities that change page sizes by copying without using an intermediate unload file. Such changes are in line with what was described as prior art in the application-as-filed, and suffer from the same problems and performance degradation associated with fragmentation and badly clustered indices.

Further, absent in the citation of Sockut, or the entire Sockut reference, is a teaching or suggestion for writing to a larger page, rows added to a designated object to be reorganized. Also, absent in the Sockut reference is a teaching or suggestion for permitting continual access to said designated object during said writing step. Further absent in the Sockut reference is a teaching or suggestion for reading constituent rows from a plurality of existing pages corresponding to said designated object and subsequently copying said constituent rows to said

larger page and externalizing said designated object. Absent such teachings, the Sockut reference, either by itself or in combination with the Iyer reference, cannot render obvious the teachings of claims 13 and 18.

Applicants wish to note that the above-mentioned arguments for independent claims 13 and 18 substantially apply to dependent claims 14-17 and 19-22 as they inherit all the features of the claim from they depend. Applicants, therefore, respectfully request the Examiner to withdraw the rejection with respect to claims 13-22 and, hereby, respectfully request the Examiner to allow claims 13-22.

If the examiner still feels that that the features of Applicants pending claims are taught or suggested by the cited references, Applicants respectfully remind the examiner that it is the duty of the examiner to specifically point out each and every limitation of a claim being rejected as per §1.104(c)(2) of Title 37 of the Code of Federal Regulations and section 707 of the M.P.E.P., which explicitly states that “the particular part relied on must be designated” and “the pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified”.

SUMMARY

As has been detailed above, none of the references, cited or applied, provide for the specific claimed details of applicants' presently claimed invention, nor renders them obvious. It is believed that this case is in condition for allowance and reconsideration thereof and early issuance is respectfully requested.

As this response has been timely filed, no request for extension of time or associated fee is required. However, the Commissioner is hereby authorized to charge any deficiencies in the fees provided to Deposit Account No. 09-0460.

If it is felt that an interview would expedite prosecution of this application, please do not hesitate to contact applicants' representative at the below number.

Respectfully submitted,

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